Name: Date:

Polynomial Factoring solution (version 686)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 10x + 52 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(52)}}{2(1)}$$

$$x = \frac{-(-10) \pm \sqrt{100 - 208}}{2(1)}$$

$$x = \frac{10 \pm \sqrt{-108}}{2}$$

$$x = \frac{10 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{10 \pm 6\sqrt{3}\, i}{2}$$

$$x = 5 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-7 + 6i$ and $2 - 8i$ in standard form $(a + bi)$.**

Solution

$$(-7 + 6i) \cdot (2 - 8i)$$

$$-14 + 56i + 12i - 48i^2$$

$$-14 + 56i + 12i + 48$$

$$-14 + 48 + 56i + 12i$$

$$34 + 68i$$

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3. **Write function $f(x) = x^3 - 3x^2 - 6x + 8$ in factored form. I'll give you a hint: one factor is $(x - 1)$.**

Solution

	1	-3	-6	8
1		1	-2	-8
	1	-2	-8	0

$$f(x) = (x-1)(x^2 - 2x - 8)$$

$$f(x) = (x-1)(x-4)(x+2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7)^2 \cdot (x+2)^2 \cdot (x-1)^2 \cdot (x-5)$$

Sketch a graph of polynomial $y = p(x)$.